

## Diversity of the *Clostridium difficile* Toxins Genes Expression in Response to Antibiotics

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**Background & Objectives:** *Clostridium difficile* is causative agent of severe intestinal disease in hospitalized patients. Increased expression of the bacterial toxins (TcdA / TcdB) in response to prescribed antibiotics is important in the disease progress. The aim of this study was to investigate diversity of different clinical isolates of *C. difficile* in expression of these toxins in the presence or absence of different antibiotics at similar conditions.

**Methods:** Suspicious isolates of *C. difficile* which had been obtained from hospitalized patients fecal samples were cultured on specific medium and confirmed with PCR for *cdd3* gene. Susceptibility of the isolates was determined against five different antibiotics by agar dilution Methods according to the CLSI guideline. Differences in level of toxin expression were determined for five isolates with different resistance profiles by Elisa methods after growth in appropriate culture medium at t24. Based levels of differences in expression potency of the toxins were considered in all of the estimations.

**Results:** Different isolates in this study showed 2-15 fold of changes in expression of these toxins at same condition. Diversity in expression of *C. difficile* toxins in medium with ciprofloxacin, amikacin, ceftazidime, metronidazole and imipenem were 1.24, 1.16, 0.679, 0.531 and 0.124, respectively. The results showed highest induction effects of ciprofloxacin and amikacin and low induction effect of metronidazole and ceftazidime in expression of the bacterial toxins. Interestingly imipenem has an inhibitory effect in the expression levels of these toxins.

**Conclusion:** Our findings showed that different isolates have different ability in production of *C. difficile* toxins and also different antibiotics have different induction effect in expression of these toxins. It is possible that some antibiotics can effect as a positive inducer on toxin gene expression. So it is essential to investigate the effect of antibiotics on the bacterial growth and expression of their toxins genes.

**Keywords:** *Clostridium difficile*; ELISA; Gene Expression